

OF NON-PRODUCTS VENDOR COMPUTED ANALYSIS

INPUT

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Planning Services for Management

OFFICE PRODUCTS VENDOR
COMPETITIVE ANALYSIS

DECEMBER 1983



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OFFICE PRODUCTS VENDOR COMPETITIVE ANALYSIS

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I INTRODUCTION

I INTRODUCTION

- This report covers competitive analysis of Office Products Vendors and is produced by INPUT as part of the Field Service Program for the United States, for clients of that program.
- Decisions made by field service management should be guided by user requirements and their satisfaction with the vendor's services. However, ultimately decisions should be measured against the vendor's financial resources and the additional revenues that will come from additional service options.
- New issues, such as an expanded role for field service and user involvement in performing maintenance, should be analyzed in the light of users' opinions, but any decision to develop field service options of this nature must depend on the business opportunities that the options represent for each vendor.
- For the sake of confidentiality, vendor financial information is summarized. This will nevertheless provide an overall view of the marketplace. Vendor-specific information may be found in the user survey. Only in those areas significantly different from the mean were product type treated separately.
- The vendor case studies presented at the end of this report were the results of extensive secondary research. There was a two-fold justification for their inclusion in this report; first, these companies are prominent within the industry; second, these companies help illustrate strategies presented in this report.

A. DEMOGRAPHICS

- A total of fifteen office product vendors were analyzed in completing this report. The products marketed and serviced by those vendors are as follows:
 - Copiers.
 - Facsimile machines.
 - PBX, PABX.
 - Personal computers.
 - Word processors.
 - Workstations.

B. METHODOLOGY

- The basis for this survey is the questionnaire shown in the Appendix. Vendor data was gathered from interviews when possible. However, when unavailable, information was gathered from publications and other reliable sources. Confidentiality was assured by summarizing all information. Comments concerning vendors are made by product type only when results varied significantly from the norm.
- The reluctance of several vendors to discuss areas of the survey limited the statistics available for this report. Also, reported actions taken by vendors to improve user satisfaction are limited to those of respondents. However, vendors from each product type were interviewed.

II EXECUTIVE SUMMARY

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A. PROFITABILITY TARGETS

- The office product vendor has yet to realize the potential of field service in revenue and profit generation, value to sales, value to customers, and as a means for generating an image of high product quality. Office product salespeople have traditionally treated field service as a negative when selling products, except where maintenance giveaways or discounts have been offered in order to close sales. A few office product vendors have treated maintenance as a business and in these organizations field service is a major source of revenue. Such organizations tend to divisionalize field service to give it the voice it merits within the corporation.
- Most office product vendors were reluctant to discuss their profitability targets for field service. The few who responded stated that they expected a profit of between 3.5% and 8.0%. Some vendors felt field service should not be considered a profit center; however, in line with vendors of large and small data processing systems, this conception of field service is disappearing rapidly as office product vendors realize the revenue potential.
- On average, field service revenues represented 13% of the total corporate revenues for the responding vendors. This represents a very significant portion of the business. These revenues became particularly important during the sluggish market of 1982 when sales of office products slipped. Future

maintenance offerings that do not affect the vendor's service profits must build on a secure profit margin from existing service; this means that a method must be found for protecting today's service revenue base, possibly through long-term contracts.

- The importance of including field service development costs in the product sales price cannot be overemphasized. These costs include course development, design and serviceability, support personnel, documentation, and logistics planning. If these costs must be recovered through maintenance revenues, the latter become inflated and third-party groups have an opportunity to compete for business.
- The total service concept presented by INPUT throughout the survey can provide new revenue sources for vendors. These sources will replace revenues lost due to declining hardware maintenance prices (and possibly due to third-party maintenance groups). Also, vendors can make use of the increased resources to provide a better quality service, as well as a more complete service.

B. OPPORTUNITIES ARISING FROM THE DISPARITY BETWEEN USER REQUIREMENTS AND VENDOR OFFERINGS

- With most vendors moving away from on-site maintenance and increasingly relying on users to determine product problems, an opportunity exists for third-party maintenance companies to increase their maintenance base. Many of these independent corporations are now aggressively pursuing the office products market. Nowhere is this opportunity greater than in personal computers.
- Coupled with this opportunity is the growth of third-party parts repair depots. Most vendors charge up to three times cost for parts; thus OEMs, distributors, and dealers will continue to explore alternate service sources.

- Vendors also have a clear opportunity to more efficiently employ their resources. Many users expressed the opinion that they receive a greater level of service than required in many areas. These areas are detailed in the user survey. To improve user satisfaction, vendors should shift available resources to concentrate on deficient areas.
- The documentation being shipped to users of office product systems needs improvement. The opportunity here is to increase product sales by supplying effective documentation. Field service could be instrumental in generating this material because of their knowledge of users' capabilities and needs. Currently documentation tends to be the responsibility of marketing, whose main goal is to promote sales rather than deal with the detailed needs of existing installations.
- Office product equipment will experience an increase in nonauthorized product upgrades and attachments. New communications methods and media will create the need for network maintenance. These developments, coupled with present users' desire for single-source maintenance, will provide some interesting challenges. Vendors can take a hard line (i.e., maintaining only their own equipment) or can supply maintenance, on a sole-source service basis, on all the products found at the user sites.
- The attractions of single-source maintenance are many:
 - The user has a single-service supplier, responsible for all products at the site.
 - The vendor need not supply service to all of the products but may choose to broker the requirements to an outside source.
 - Even though the vendor may have no intention of becoming a supplier of third-party maintenance in the foreseeable future, the option is open

for vendors to do so at any point in time without having to change the contractual relationship with the client.

- Competitive service organization contacts with the vendor's users are eliminated (and also eliminated are user comparisons of the vendor's service quality with the service quality of other service vendors).
- There is the distinct possibility that vendors will choose to use independent companies to provide their maintenance. This is becoming an attractive alternative for many manufacturers and may be the way of the future. If this course is followed, then the development of field service interface personnel is crucial. Vendors must understand that their name is on the product and that users relate the product's performance to them. This move could seriously jeopardize future product sales. The personal computer business demonstrates this. Only those products with an effective support organization will survive in the future.

C. CONTRIBUTIONS OF FIELD SERVICE TO MARKETING AND PRODUCT DEVELOPMENT

- Exhibit II-1 shows field service management's rating of their influence over improving or controlling products shipped to the field. Managers were also asked for their opinions on how that influence would change.
- As the industry moves away from the traditional on-site maintenance service methods of supporting products, the objectives for product design, specifications, serviceability, diagnostic development, and product performance become more critical from a support standpoint. The low ratings for several of the aforementioned items are reminiscent of the early days of large systems. It wasn't until severe customer problems surfaced that large-system vendors began to place more emphasis on field service. Office product manu-

EXHIBIT II-1

FIELD SERVICE MANAGEMENT INFLUENCE OVER OFFICE PRODUCT SHIPMENTS

ACTIVITY	RATING (1-10)	
	1983	1985
a. Product Specifications	5.2	5.8
b. Product Design	5.2	6.0
c. Serviceability Design	7.5	8.3
d. Diagnostic Development	8.2	7.6
e. Selection of Test Equipment	8.4	9.0
f. Spares Requirement	8.3	9.3
g. Exception to Maintenance Contract	7.4	8.2
h. Product Performance Objectives	5.4	6.4
i. Quality Control in Manufacturing	4.6	5.6
j. OEM Acceptance Criteria	3.3	4.3

Rating: 1 = Low, 10 = High

facturers should take a lesson from this and give more weight to the opinions of field service.

- Field service has the opportunity to expand its responsibilities to include the selling of upgrades, supplies, and services. Whether field service retains its identity as a maintenance organization or expands its role to that of customer service or post-sales support is a decision many office product vendors will make in the next few years. INPUT believes that responsibility for total support of customers after the initial sale should become field service's responsibility. The name Customer Services and Support better describes this future.

D. SOFTWARE SUPPORT INTEGRATION

- Like the rest of the industry, hardware and software maintenance is being integrated. Both operating system and applications program maintenance is being offered by almost half of the surveyed vendors. These offerings will continue to increase over the next several years until all products (software, documentation, hardware, etc.) are serviced and supported by the field service organization.
- The degree of integration of hardware and software support in the office product area is still somewhat confused. While hardware personnel are called upon to do much of the problem determination, software support personnel communicate separately with the user. Software support has always been the responsibility of field service in large- and small-system vendor organizations. That trend is now moving into the office products area, which will result in a reduction in confusion and delays and an increase in the users' rating of software support.

- This new responsibility for software support provides natural career growth for field service engineers. Hardware maintenance will require less technical expertise in the future because of modularization and improved diagnostic tools. The current maintenance of software is in many ways similar to hardware maintenance in the past. The same diagnostic expertise is required. Field service can provide this expertise and can improve overall customer satisfaction.
- The key to making this merger successful is the investment made in education. The classes and programs needed are not short-term and do not provide results overnight. The key to a successful service organization lies with the training program implemented by each vendor.
- The functions that need to be integrated include hardware support, software support, consulting, training, and documentation. Keeping these groups separate does not allow the program to work. The need to integrate goes beyond putting the groups under one manager; the staff itself needs to be responsible for (and capable in) both hardware and software. If management is unwilling to make a full commitment to do this, then it is best not to make any move in this direction and to leave the groups separate.

E. ORGANIZATIONAL DEVELOPMENTS IN FIELD SERVICE

- Vendors within the systems business are continually reorganizing their structures in an attempt to more effectively handle business needs. In the office products sector some unique needs exist requiring corporations to have organizational set ups different from the industry as a whole. Some of these changes are creating more serious situations than the ones they were to have rectified.

- Some organizations have decentralized their operations to place decision making closer to the customer base. An apparent problem began to present itself, causing these vendors to question the feasibility of continuing this decentralization. Basically a lack of consistency and a duplication of responsibility and manpower resulted. Costs began to rise, reducing the profit targets vendors had established. Friction between field service groups made decision making difficult. The users survey did not show any significant improvement over corporations that had a more centralized structure.
- A more common trend among vendors is a partial merging of the marketing and field service groups. Corporations may go through some internal political problems, but the resulting structure will provide a total services support group with increased product development involvement for field service. This merging will also reduce staff overhead, allowing more resources to be focused in the field. More importantly, user confusion and dissatisfaction concerning support should be reduced.
- Many office product vendors, especially in the personal computer sector, make use of OEMs and dealer networks to support their products. Field service is basically structured to support these retail outlets. From survey results this structure has basically been ineffective. Whether vendors can continue using this structure is questionable. One reason vendors give for this not being successful is the inexperience found in most dealerships. Another is the attitude of the dealers: most are only concerned with selling product and do not attempt to sell service (fearing that this may impair the sale).

F. AREAS OF CONCERN FOR VENDORS NOW AND IN THE FUTURE

- The following is a summary of areas that occupy vendor upper management attention in the office product area and for which no clear solution has been found:

- Should there be a slowdown in the movement toward user involvement in hardware maintenance?
- How does one handle areas outside the vendor's support locations and still be competitive with larger vendors that provide support in those locations?
- Is there a method of pricing maintenance that does not jeopardize future profits?
- What kind of product performance guarantees are needed in the area of repair time and software maintenance turnaround time?
- To what extent should the role of field service be expanded to include the marketing of services and supplies?
- Can dealerships perform the necessary support functions to the satisfaction of personal computer users?
- Should office product vendors expand the use of third-party maintenance organizations?
- How will we deal with foreign product add-ons and attachments when problems occur on our systems?
- Should we provide maintenance for local-area networks and the network products attached?

III FIELD SERVICE OPERATIONS

III FIELD SERVICE OPERATIONS

A. INTRODUCTION

- This section deals with the several technical and organizational measurements, controls, and structures required to support the office product portion of the systems business. Because of the use of dealers and distributors, management must be more creative and flexible. Because of the high-volume nature of these products, mistakes create a serious threat to the vendor's survival. The product mix varies from facsimile equipment to workstations. In this report we will separate, when applicable, issues that are unique to these product groups.
- Several vendors have no direct contact with the user and must rely on third-party organizations and authorized representatives to handle their support function. This is particularly true in the personal computer and word processing organizations surveyed. Because of this, user satisfaction is very difficult to control. This report can only reflect both the attitude of the vendor and how the user perceives the vendor's success in supporting the products involved.

B. MANPOWER PRODUCTIVITY

- According to Exhibit III-1, vendors generally measure field service productivity by means of the ratio of gross revenues per field person, coupled with other factors such as callbacks, units maintained, and calls per day.
- Although revenue per field person is a valid measurement, maintenance pricing changes and deteriorating levels of service can significantly vary the results achieved. Travel factors and other responsibilities also effect this measurement. A combination of measurements must include financial, productive, and quality assurance criteria to be effective. To accurately measure this criteria, an effective reporting procedure must be in place.
- Specific areas were surveyed to determine if new methods were being used to improve overall service and to determine what productivity gains, if any, were realized.
 - Over 75% of the vendors surveyed had instituted the use of repair centers, with over 60% gain in productivity. The user survey, however, showed a general reluctance on the part of users to accept repair center maintenance.
 - Fifty percent of the vendors had instituted central dispatch, support centers, cross-training, and field education programs. The productivity gains ranged from 10% to 25%, as shown in Exhibit III-2.
 - Only 25% of the vendors are using regional parts depots and multiple territory assignments. The productivity gains realized may not make this expense worthwhile, yet vendors will need to address users' desire for more local spares availability.

EXHIBIT III-1

VENDOR USE OF FIELD SERVICE PRODUCTIVITY MEASUREMENTS

MEASUREMENT METHOD	PERCENT	
	YES	NO
a. Ratio of Gross Revenues Carried per Field Person	60%	40%
b. Ratio of Personnel to Equipment by Category	20	80
c. Ratio of Personnel to Management	20	80
d. Net Ratio of Expenses to Revenue after Cost of Improvement	40	60
e. Other	60	40

EXHIBIT III-2

VENDOR PRODUCTIVITY IMPROVEMENTS EXPERIENCED

SERVICE SURVEYED	PERCENT		
	USING SERVICE	NOT USING SERVICE	IMPROVEMENT
a. Remote Diagnostics	25%	75%	10%
b. Repair Centers	75	25	60
c. Regional Parts Depot	25	75	10
d. Central Dispatch	50	50	25
e. Support Centers	50	50	10
f. Field Education	50	50	20
g. Cross-Training	50	50	25
h. Multiple Territory Assignments	25	75	15

- There are differing opinions on the benefit of field service performing depot repair. As products become more modularized and test equipment more expensive, it is generally agreed that manufacturing should be responsible for parts repair. The concern expressed by many field people is the availability of spares, which is a management problem that must be addressed if competitive maintenance prices are to be offered.

C. SERVICE DELIVERY MODES RELATED TO SUPPORT STRUCTURES

- The trend among vendors is to move away from traditional on-site maintenance. The most favored method appears to be user diagnosis with field support center assistance. Exhibit III-3 shows the surveyed vendors' attitude versus the users' attitude concerning the different service methods.
- User attitude varies by product type to a certain degree, but vendors must realize that shifting the responsibility of maintenance to the user does not lower the cost of ownership to the believed extent. A user must assign internal resources when a problem occurs. The user experiences a loss of productivity that can be translated into dollars. This appears to be one reason users are so reluctant to accept alternate methods of service.
- There are also differing opinions among vendors as to the definition of remote diagnostics. To most user and vendor organizations remote diagnostics identify to the vendor a failed subsystem or component. To some vendor organizations, the ability to run the system and verify its operation is also defined as remote diagnostics. This latter method should be considered to be remote verification testing.
- Problem determination is still basically done by technical people based on test results. Prior to moving too quickly into user-involved maintenance, vendors must set diagnostic standards for their equipment.

EXHIBIT III-3

VENDOR RATINGS OF OFFERING ALTERNATIVE DELIVERY METHODS FOR MAINTENANCE AND USER REACTION TO THEM

MAINTENANCE DELIVERY METHODS	RATING (1-10)						
	VENDOR ATTITUDE	COPIER USERS	FACSIMILE USERS	PBX PABX USERS	PERSONAL COMPUTER USERS	WORD PROCESSORS USERS	WORK- STATION USERS
a. Traditional On-site Response to Trouble Calls	6.6	8.9	8.7	8.3	7.0	8.8	8.4
b. Field Support via Remote Diagnostics	8.4	6.1	5.7	6.2	6.6	7.0	6.4
c. Field Support via User Self- Diagnostics	9.2	3.9	3.0	5.1	5.2	5.3	5.0
d. Telephone Field Service	7.8	-	-	-	-	-	-

Rating: 1 = Low, 10 = High

- Expecting most users to diagnose and replace failing modules is going to open the door to several third-party maintenance organizations. There will always be users refusing to become involved in maintenance. A more serious concern is the engineering change activity experienced by most products. The more sophisticated user will insist that regardless of who maintains the equipment, the manufacturer is responsible for providing or installing the changes that fix malfunctions of equipment. This affects the vendor by requiring field engineering involvement without maintenance revenues.
- Vendors should provide a complete menu of services. This menu should not be so large that it is confusing to users, but should give users the ability to make a choice based on needs. This approach will be difficult to administer, but will protect the installed base.

D. SPARE PARTS DISTRIBUTION, CENTRALIZED DISPATCH, AND PARTS RETURN

- Logistics planning has always been one of the most serious challenges within field service. With high-volume products, such as office systems, this problem intensifies. Keeping the latest engineering-level spares requires more expense and management control.
- Trends of capital investment in spares vary depending on product design. Vendors surveyed whose products are repaired by component replacement show an average reduction of 2% over the next two years. Those whose products are changing to a more modular design show an increase of 50% over the next two years. This is due to the cost of the modular parts versus components.

- As discussed previously, only 25% of the vendors surveyed are using regional parts depots, mainly because of the cost of test systems as well as because of the duplication of responsibility.
- The average spares investment of those vendors surveyed equals 28% of the gross service revenues for 1983. Most manufacturers of high-volume products strive to achieve the lowest sparing levels possible. For currently installed products, the sparing level should be 4% to 7%. One benefit derived from having manufacturing responsible for parts repair is the ability to remove returned parts from field inventory and place them into the manufacturing pipeline. This assists field service in maintaining stable parts inventory levels.

I. CENTRALIZED DISPATCH

- The trend toward centralized dispatch is moving swiftly, with over 50% of the vendors employing it in 1983. Centralized dispatch enables management to monitor the performance of products on an ongoing basis. As previously mentioned, centralized dispatch has increased productivity 25%.
- To demonstrate the effectiveness of how centralized dispatch improves user satisfaction, one must only look at the response and repair times of maintenance in the personal computer area, as compared to the rest of the industry. These service organizations are mainly independently authorized representatives with no central point of contact. The vendor is relatively unaware of how its product is performing until problems become explosive or until surveys are conducted. With the projected increase of installations of personal computers, a tremendous opportunity for a large third-party maintenance organizations presents itself. Using centralized dispatch could bring to bear experienced technical personnel to resolve problems before they become critical.

2. PARTS RETURN

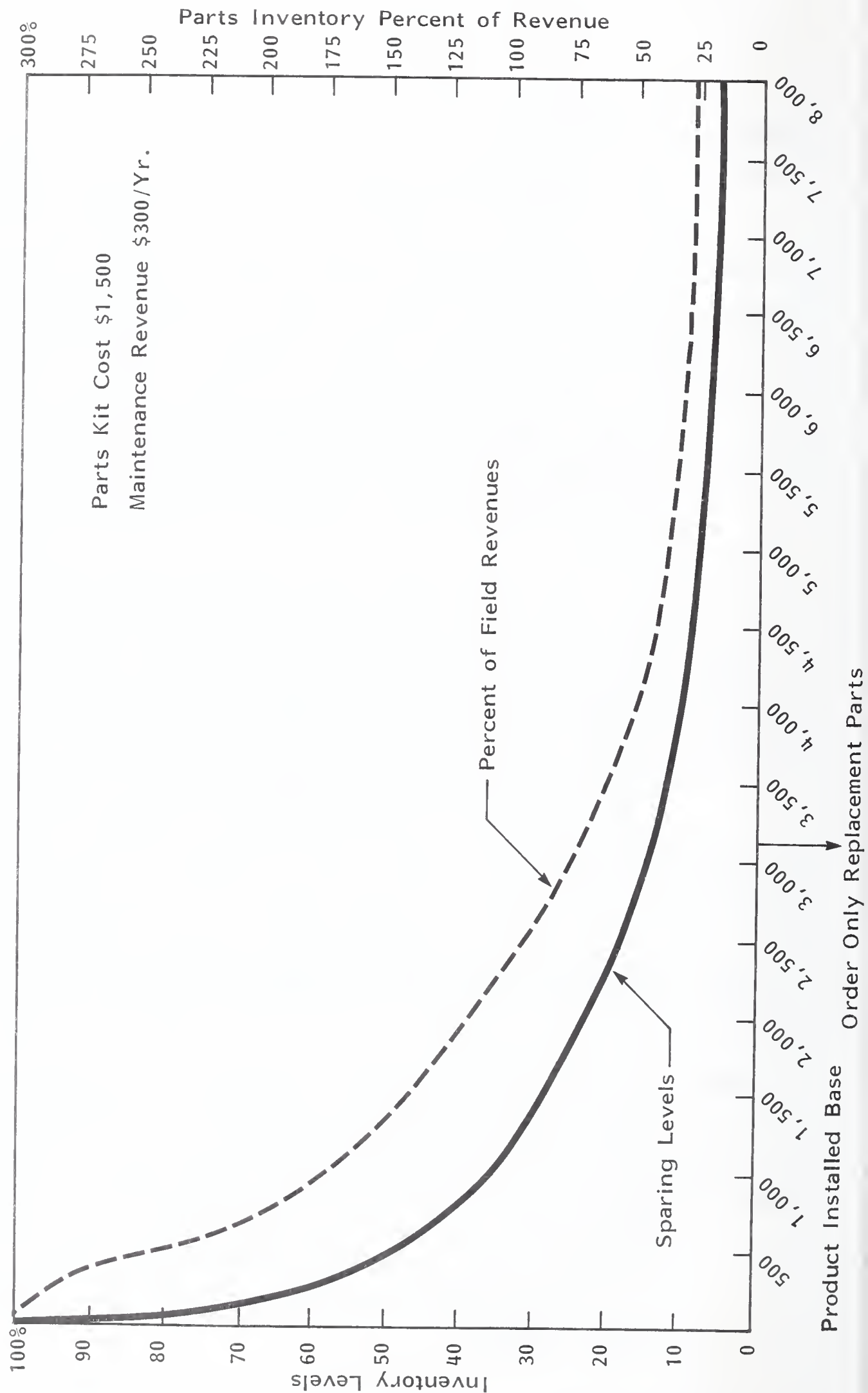
- Several methods are now used to control the return of spare parts. Some vendors serialize parts over a predetermined cost and set up a tracking system that provides a continuous control over the movement of all parts. This system can result in a huge data base and requires a great expenditure for administrative services. Other manufacturers and vendors charge the field service engineer the cost of the part and provide a return parts credit when returned. Whatever method is used, poor parts management results in inventory buildup and discrepancies that affect overall field revenues; the trend today is to keep the spares in regional locations under the control of logistics personnel.
- Exhibit III-4 shows the apparent sparing curve of the surveyed vendors. It appears that the main management tool for reducing spare costs is the careful tracking of product volumes and order-only replacement spares at a specific install base, in the case of our example, approximately 3,200 units. By more carefully tracking product performance and achieving a reduction of one-third in parts kit cost, a spares investment of 20% of total revenues could be realized. The surveyed vendors have set an average 26% goal, which seems conservative.

E. CONTROL OF INCIDENT REPORTING AND ESCALATION PROCEDURES

- There has always been a disagreement on the usefulness or accuracy of incident reports. At this time, however, the more successful field service groups not only use incident reports but require forty-hour reporting. Fifty percent of the surveyed vendors use real-time incident reports. Those using incident reports also require that parts use be included. It would be particularly useful if vendors who market through dealers received status or incident reports from the dealers. In any event the trends seem to indicate very little change in the future.

EXHIBIT III-4

SPARE PARTS INVESTMENTS AND INVENTORY LEVELS



- Users seem generally satisfied with the escalation procedures used by vendors. The only exception to this is in the personal computer area.

F. SOFTWARE MAINTENANCE INTEGRATION WITH HARDWARE MAINTENANCE

- Exhibit III-5 shows the vendors' progress toward integrating software maintenance with hardware maintenance. The trend follows that occurring in other sections of the systems business. The one area showing no maintenance at this time and none planned in the future is third-party software. This is understandable because most vendors require the author of such software to support the product. The trend toward merging the internal organizations that provide hardware and software support at a corporate level is increasing with little or no difficulty. This should provide users with a less confusing support strategy.

G. PRODUCT PERFORMANCE OBJECTIVES VERSUS ACTUAL PERFORMANCE

- Except for the personal computer sector of the office products group, vendors do a fairly good job of meeting user requirements. Exhibit III-6 shows the vendors' view of actual availability, response time, and repair time, versus the users' impressions of same. In cases where no vendor response was available, "n/a" was used. Although several differences exist between users' and vendors' opinion of performance, only in the case of personal computers were users clearly dissatisfied.

EXHIBIT III-5

VENDORS' INTEGRATION OF SOFTWARE SUPPORT INTO HARDWARE SUPPORT

INTEGRATED SERVICES	PERCENT	
	1983	1985
a. System Control Software	25%	42%
b. Application Software	2.5	11
c. Maintenance of Third-Party Software	0	0

EXHIBIT III-6

PRODUCT PERFORMANCE AS VIEWED BY VENDORS AND USERS

PRODUCT PERFORMANCE CRITERIA	REPAIR TIME (Hours)		RESPONSE TIME (Hours)		AVAILABILITY (Percent)	
	Vendor Actual	User Actual	Vendor Actual	User Actual	Vendor Actual	User Actual
All Products	1.6	6.3	4.0	5.7	96%	94%
Copiers	2.0	1.6	2.0	5.7	95	96
Facsimile Equipment	2.5	4.5	8.0	9.8	N/A	95
PBX, PABX	2.0	3.7	4.0	3.6	N/A	99
Personal Computers	.5	19.4	4.0	9.3	N/A	90
Word Processors	1.5	2.1	5.0	3.4	97	96
Workstations	.8	4.2	4.0	3.8	N/A	97

- The use of dealers and distributors seems to hinder the vendors' ability to understand the users' view of their products. The mean repair time of 19 hours that was reported by personal computer users is totally out of line. If dealers cannot improve on this quickly, an alternate method of supporting these products must be implemented. One method is to use a national third-party maintenance group to assist and support dealers when required. This would provide a consistent level of service nationwide and keep any additional overhead to a minimum.
- Interesting copiers show the shortest repair time, although response time could be improved.
- Throughout the survey, most vendors consider remote maintenance and user diagnosis as the most important services to offer. Until users are totally satisfied with product performance, implementing this service will be difficult.

H. HANDLING REMOTE CUSTOMERS (BEYOND VICINITY OF ESTABLISHED SERVICE LOCATIONS)

- In most cases vendors charge a premium or zone charge on calls outside the vicinity of a service location. On larger systems the cost difference is not as noticeable as it is on office products. Large corporations have a distinct advantage in this marketplace because of the number of support locations. Smaller vendors should investigate the possibility of using independent agents in these locations.
- One method of service for these locations is the mail-in or carry-in maintenance plan. These plans are very successful in many locations, but many users do not have the personnel in outlying locations that have the ability to properly service or mechanically handle the equipment. An independent service agent could be effective.

I. FIELD AUDITS

- By 1983, 57% of the vendors surveyed had instituted a formal field audit program, with 71% planning to have one in place by 1985.
- More interesting is the manner in which these audits are conducted. Not one vendor has a program that is similar to any other vendor's. The programs range from:
 - A specialist traveling with a field engineer.
 - A spot check of IRs.
 - Measurements of callbacks.
 - The check-out of deinstalled equipment.
- In the past, a site audit consisted of visiting the manager of the account to be audited and reviewing the performance history in order to determine if it matched the IR history. Also, machine engineering levels were checked and serial numbers compared. Today the volume of equipment makes complete field audits difficult, but random surveys should be made by the vendor field management or by support personnel.

J. LOCAL-AREA NETWORK SUPPORT

- At this time, only 38% of the vendors surveyed have planned or set policies for maintaining products connected to local-area networks. One vendor plans to offer a service to perform problem determination for not only the network but on equipment attached. Most vendors will not discuss the details of their

plans. According to the survey, in 1985 over 62% of the vendors plan to offer some formal plan for maintaining local-area networks. Some vendors express the opinion that users will move very cautiously into the use of LAN because of the expense involved. The flexibility offered, however, should motivate users into moving rapidly.

IV FIELD SERVICE BUSINESS AND MANAGEMENT
ANALYSIS

IV FIELD SERVICE BUSINESS AND MANAGEMENT ANALYSIS

A. INTRODUCTION

- Vendors were very reluctant to discuss the financial management issues surveyed. It could not be determined whether this reluctance was due to a lack of knowledge or to a concern for security of information. Therefore, much of the following information came from a knowledge of the vendors' operations.

B. FIELD SERVICE REVENUE SOURCES

- Office product revenue sources for field service differ, depending on product types and corporate structures. Several vendors provide their own maintenance, while others use third-party organizations.
- During 1983 field service revenues accounted for approximately 20% of total corporate revenues for those vendors surveyed. Several factors will effect these revenues in the future, however.
- Those organizations providing their own maintenance services have revenue sources similar to those of the large-system manufacturer. These sources are hardware maintenance revenues, installation and deinstallation charges, and the maintenance of software products.

- As products become more modularly designed, with users replacing the modules when defective, hardware maintenance revenues as a percentage of the installed base will decline. Users also express dissatisfaction with the need to pay for software maintenance. By selling an overall maintenance contract covering all malfunctions, revenues could be held to existing levels and manpower could be used more efficiently.
- Those organizations using third-party maintenance fall into two categories. Some have an agreement with one third-party organization to provide service nationwide. Others rely on dealers or authorized agents. The source of field service revenues differs. Parts, education, third-party contracts, and mail-in or carry-in service make up their main income.
- For vendors employing third-party maintenance, a different threat to revenues exists. Parts revenues will be jeopardized by independent parts repair depots. Education revenues will be reduced by independent education companies. Carry-in and mail-in revenues are threatened by corporations gearing up for that purpose. All these threats will be difficult to counter.
- In order to increase service revenues, field service should be given an expanded role. The field service group should be given all after-sales support responsibility.

C. EXPENSE CONSTITUENTS

- Field engineering expenses can be separated into two distinct categories: those required for product development and those needed to provide current product support.

- It is important to control these expenses separately or else hourly manpower costs will be distorted. Several vendors stated that they divide the total field engineering expense budget by the total number of field service engineers to determine their hourly rate. The use of this method could have disastrous results in the future. Development costs, such as product design maintainability, documentation development, education course development, and logistics planning are clearly costs of product items and should be included in the product price. If they are not separated and included in the maintenance price, those costs may never be recovered because of third-party maintenance competitors. These organizations do not have the R&D costs found in the vendor organizations and thus can offer a significantly lower maintenance rate.
- According to the survey, direct labor and parts are the largest expense items and make up 70% of overall field service expenses. Travel is another item that is significantly affecting field service expense. Many corporations have altered their car programs and expense reimbursement policies during 1983.
- Support and overhead are being brought under control by new innovations. Remote maintenance, alternate training methods, and administrative centralization are beginning to pay dividends. Those organizations continuing to decentralize could find the going very tough.

D. EXCLUSIONS (INTERNAL TRANSFERS)

- There are several items and areas of responsibility that are handled by field service organizations and for which field service organizations must receive reimbursement from internal groups. Some of these are:

- Warranty.
 - Field changes.
 - Sales upgrades.
 - Internal field service.
 - Other.
- From discussions with vendors, many managers feel that the administrative overhead to handle these transfers is not worth the time and energy expended. The fact remains that these expenses must be tracked and what other method that would be effective. In the case of high-volume products these costs can become staggering.
 - An example is field changes. If the average field change costs \$150 with an installed base of 20,000 systems, a possibility of spending \$3 million exists. Of course, most companies allow field service to set up a selective engineering change program, but there are costs involved there also. If a company wants to measure accurately the financial performance of field service, then internal transfers are a necessity.
 - Many vendors use the incident report as a means of generating an internal transfer request. This appears to be the most effective method of recovering real costs.

E. OPERATING RATIOS

- Exhibit IV-1 shows the surveyed vendors' average operating ratios and forecasts for 1985. Interestingly, some trends that are relevant to future office products systems are beginning to establish themselves.

EXHIBIT IV-1

VENDOR SURVEY OF OPERATING RATIOS

EXPENSES	PERCENT OF REVENUE		
	1982	1983	1985
a. Direct Labor	37%	40%	38%
b. Parts and Materials	30	28	26
c. Travel Expense	15	13	10
d. Field Overhead	5	5	7
e. Support Overhead (Administrative, Training Support, etc.)	10	12	14
f. Profit	3	2	5

- Direct labor costs apparently peaked in 1983. This was not due to a decline in salaries but to a shift from on-site to repair center maintenance and user maintenance.
- Parts and material expenses are dropping because of more centralized stocking and parts control.
- Travel expenses are beginning to decrease because of new maintenance philosophies, as mentioned previously.
- Field overhead will continue to increase due to the opening of repair centers for mail-in repair. The percentage of users accepting this method of maintenance will determine the speed of this shift.
- Support and headquarters overhead will grow to support new field service support methods.
- Forecasted profits remain in the 2% to 5% range but will become a more important corporate revenue generator in the years just ahead.

F. ADMINISTRATIVE ALLOCATIONS AND OVERHEAD

- Most of the surveyed vendors allocate administrative and overhead costs at a fixed percentage of total field service revenues. These functions are generally performed at the headquarters location. In recent years, several vendors attempted to move some of these functions to field locations. The results have been less than satisfactory. Duplication of effort and a lack of consistent practice resulted.

- In 1983 several of the field service functions have been merged with other administrative groups like marketing and sales. This merging has significantly lowered administrative costs for everyone.
- In the office products portion of the systems business, the independence of field service will be significantly reduced over the next few years. New organizations combining field service and marketing support will be formed to provide several functions. Education, contract administration, market research, and after-sales support are logical candidates for such a merger. Although this move will not be greeted positively, it will keep administrative costs to a minimum and will be very effective.

G. TREATMENT OF SPARE PARTS AND TEST EQUIPMENT

- Controlling spare parts has always been a difficult and emotional undertaking. One difficulty is the need to handle both vendor-manufactured and OEM-supplied spares. As was mentioned earlier, vendor-manufactured spares should be easily controlled by returning them to the pipeline. OEM spares are much more difficult. During product introduction, spares are at a premium. At the end of product life excesses invariably exist.
- Field service is totally responsible for tracking, repairing, and ordering all OEM spares for most of the vendors surveyed. Parts tracking has become very sophisticated, with generally reliable data base information available at all times.
- Methods to insure parts returns have not significantly changed. Return parts credit based on parts value and need are generally used.
- For several manufacturers of office products parts are a prime revenue source. Several manufacturers offer parts credits to purchasers, but not at

the level found internally. Manufacturers basically treat spares in the same manner as finished goods.

- All vendors expense parts below a specified cost level, with the value varying from \$100 to \$200.
- Most vendors surveyed indicated an increased role for field service in the selection of test equipment during product development. This should help field service personnel maintain products more effectively during initial introduction. One of the users' main criticisms was the lack of field service preparation for supporting new products.
- The move toward modularity will affect logistics planning more than any other factor for several years. Poorly performing products will become very expensive to maintain, regardless of the failing component. Model differences and engineering level changes will raise havoc with spares.

H. METHODS OF DEPRECIATION

- Most vendors did not respond to the interview question concerning how spares, test equipment, and other assets are depreciated. However, the method most commonly used to depreciate spares and test equipment is on a five-year straight-line basis. Furniture and fixtures are depreciated by many vendors at seven-years straight line.

V INTERNAL/EXTERNAL COMMUNICATIONS

V INTERNAL/EXTERNAL COMMUNICATIONS

A. MARKETING FIELD SERVICE TO END USERS

- Vendors are beginning to offer guarantees as an inducement for increased revenues and system sales. One basic requirement for offering these guarantees is a standard to measure against. To offer a 95% guaranteed availability is misleading. Is this based on an eight-to-five prime shift or on 40 hours within a week? The point is that industry standards are going to be a result of these guarantees, whether vendors want them or not.
- Exhibit V-I shows the direct services offered within the office product sector of the systems business and the percentage of vendors offering those services currently or by 1985.
 - Over 55% of the vendors surveyed offer third-party maintenance, with an increase to 67% projected by 1985. This trend is expected to continue.
 - Office product vendors do not generally offer facilities management services, and their users do not expect vendors to provide those services. The results of the survey reflect this.
 - Vendors are rapidly moving toward availability guarantees. Currently 25% offer this service and 75% are planning to provide it by 1985.

EXHIBIT V-1

DIRECT SERVICES OFFERED CURRENTLY OR
PLANNED IN THE FUTURE

DIRECT SERVICES PROVIDED	CURRENT (percent)		1985 (percent)	
	Offering Services	Not Offering Services	Offering Services	Not Offering Services
a. Third-Party Maintenance	56%	44%	67%	33%
b. Facilities Management	13	87	13	87
c. Guaranteed Availability	25	75	75	25
d. Guaranteed Repair Time	-	100	-	100
e. On-Site Standby	62	38	88	12
f. Guaranteed Response Time	50	50	88	12
g. Variable Shift Coverage	75	25	75	25
h. On-Site Spares	75	25	88	12
i. Guaranteed Turnaround on Software Repairs	-	100	-	100
j. Remote Diagnostics	50	50	75	25
k. Preventive Maintenance and Field Changes (Nonprime Hours)	38	62	62	38
l. System Software Maintenance	38	62	62	38
m. Application Software Maintenance	38	62	50	50
n. Depot Maintenance (Pick-up)	62	38	88	12
o. Depot Maintenance (Carry/Mail-in)	75	25	100	-

Large-system manufacturers have for many years offered performance guarantees for the initial 90-day period after installation. This created considerable pressure on field service. In the office product environment it could cause more harm than good.

- Vendors offering on-site standby, and guaranteed response time will increase by 1985. This may require additional manpower within field service.
 - Understandably no vendor plans to offer guaranteed repair time or software fix turnaround time. Pressures for this by marketing may be felt in the future, but it would be a serious mistake.
 - As expected, the number of vendors offering system software maintenance and application software maintenance will increase over the next two years. This projected expansion of the field service engineers' role will require additional educational resources throughout the industry.
 - The use of depot maintenance will also increase over the next two years, with all vendors offering pick-up or carry-in maintenance. If the users are to be believed, pick-up maintenance has the only chance of success. Carry-in and mail-in will most likely be used by home computer owners only.
- A review of the user survey should be completed before offering many of the planned services. In many cases the premiums users are willing to pay will not justify offering the service.
 - Personal computer manufacturers need a revised maintenance plan. Users are asking for quality and timely maintenance. Many users have turned away from these products because of poor support services.

- Field service should market all maintenance contracts. The use of sales representatives selling maintenance contracts is becoming obsolete. They do not have the background or knowledge required to effectively do the job. Discounts and concessions have to be handled carefully or future revenue targets will be meaningless. Let those responsible for making targets control them.

B. FIELD SERVICE INVOLVEMENT IN SELLING GOODS AND SERVICES

- Users were questioned about their attitude toward field service engineers' sales roles and vendors asked about their current and future offerings. Exhibit V-2 shows the comparison.
 - Vendors seem fairly well on track except for supply sales. Plans in that area should be postponed until a better climate exists.
 - Office product users are different from the rest of the industry in their attitude toward software sales. There is a genuine acceptance of field service selling these products.
- Exhibit V-3 shows the results of other secondary services offered or planned, with the users requirements for comparison. Vendors again seem on track.

C. USER CONTACTS (QUALITY AUDITS, FREQUENCY OF MANAGEMENT CALLS)

- Copier vendors, workstation vendors, and PBX manufacturers take a much more aggressive stand on communication with users. Their overall user results show their efforts are fairly successful. Personal computer manufac-

EXHIBIT V-2

VENDORS' PLANS AND USERS' ATTITUDES TOWARD FIELD SERVICE ENGINEERS IN SALES ROLES

FIELD ENGINEERS SALES ACTIVITIES	CURRENTLY (percent)		1985 (percent)	
	Vendors Offering	Users Favoring	Vendors Offering	Users Favoring
a. Supply Sales	57%	33%	71%	48%
b. Hardware Upgrades	57	54	57	63
c. Add-on Sales	86	54	86	61
d. Software Packages	42	40	71	65

EXHIBIT V-3

OTHER SECONDARY SERVICES OFFERED

SECONDARY SERVICES	1983 (percent)	1985 (percent)	User Survey (percent)
	Vendors Offering	Vendors Offering	Users Requiring
a. Environmental Planning	57%	57%	53%
b. Physical Site Planning	42	42	54
c. Consulting Services	42	57	73
d. Customer Training	100	100	88
e. Installation Management	85	85	76

turers have the lowest rating of all vendors tested. This is not surprising since most of their efforts are aimed internally. If this trend continues, independent maintenance people will have a very lucrative business opportunity.

- The users' requirement for site audits is minimal in the office product sector. Vendors should do random checks to understand how their products are performing. These audits should be planned carefully, with a checklist assuring all required information is collected. This especially true in the personal computer area.

D. CONTRACT ADMINISTRATION

- Judging from the vendors' plans to offer a variety of contracts, administration will require additional staff and resources. Information on each contract will have to be available to field locations and repair centers in order to manage them correctly.
- Field service must be given the responsibility to both market and manage maintenance contracts. As new communications products, such as Ethernet and Wangnet, gain acceptance, maintenance management contracts will become more attractive to users.
- Eighty-five percent of the vendors surveyed offer 12-month maintenance contracts with automatic renewal. One vendor offers a five-year contract. This ensures future revenues, but most users want an escape clause. Users are divided on their attitude toward long-term contracts, but most favor automatic renewal.
- Most users prefer unbundling both hardware and software maintenance contracts. This gives them more flexibility in selecting the services they require. But vendors must guard against offering so many options that the

result is user and vendor confusion. Also, a totally bundled contract option is still a viable offering.

E. INVOICING AND COLLECTIONS

- Seventy-five percent of the vendors surveyed invoice annually, offering prepayment discounts. This makes a great deal of sense for office products because of the large volume of equipment involved.
- Overall users are generally satisfied with the manner in which invoicing disputes are resolved. Only in the personal computer area of business was there a great deal of dissatisfaction. This dissatisfaction may be the result of the overall concern users express throughout the survey about personal computers.
- One vendor negotiates payment schedules and has not set policies. This policy would appear difficult to administer and make revenue forecasting impossible.

F. COMMUNICATIONS BETWEEN FIELD SERVICE, MANUFACTURING, AND ENGINEERING

- When vendors were surveyed about field services influence on engineering and manufacturing, some disturbing answers were given. Most stated product design, product performance objectives, quality control, and OEM acceptance criteria have little field service involvement. Vendors express some hope that by 1985 their involvement will increase but not to the extent needed.
- Correcting or improving products before they ship to the field can save corporations millions of dollars. It is difficult to understand why most vendors

are so concerned with shipping for the sake of revenues that will be lost anyway because of product support costs. Many experts accuse the computer industry of short-sightedness because of this attitude.

- Exhibit V-4 shows the field service managers' view of the influence they have on product activities.

EXHIBIT V-4

RATINGS OF FIELD SERVICE MANAGEMENT'S INFLUENCE

ACTIVITY	RATING (1-10)	
	1983	1985
a. Product Specification	5.2	5.8
b. Product Design	5.2	6.0
c. Serviceability Design	7.5	8.3
d. Documentation	7.2	8.5
e. Diagnostic Development	8.2	7.6
f. Selection of Test Equipment	8.4	9.0
g. Spares Requirement	8.3	9.3
h. Geographic Control of Sales	3.2	4.0
i. Exception to Maintenance Agreements	7.4	8.2
j. Product Performance Objectives	5.4	6.4
k. Quality Control in Manufacturing	4.6	5.6
l. OEM Acceptance Criteria	3.3	4.3
m. Customer Education	5.6	5.4

Rating: 1 = Low, 10 = High

VI MAINTENANCE PRICING

VI MAINTENANCE PRICING

A. METHODOLOGIES USED

- Most vendors responded that they use competitive information when setting their maintenance prices. Although this is understandable, it is a method that could cause a total drain on all profits made from the original purchase. Field service must be self-supporting.
- Maintenance pricing should be based on product performance objectives. The fact that several field service organizations have little influence on those objectives at this time leaves them at the mercy of engineering and manufacturing.
- Corporations that have been successful for many years use extensive models when calculating maintenance prices. These models are done during product design and altered as necessary during development. This provides accurate cost-of-ownership information for all concerned.
- Exhibit VI-1 shows an example of one method used by vendors to establish maintenance prices. The following is a definition of terms used:
 - MTBF - The mean time between failures - based on 24-hours and 7 days per week.

EXHIBIT VI-1

MAINTENANCE PRICING BASED ON PRODUCT PERFORMANCE

MTBF - 8,660 Hours, 1 Call per Year

MTTR - 1.0 Hours

Travel - 1.0 Hours

FE Hourly Rate - \$100.00

P.M. - 0.5 hours per Year

Parts Use - \$150.00

Spares Req. - 5% (Parts Kit Cost \$2,000 - Depreciation 5 Years)

Yearly Call Cost Plus P.M.	
Repair Cost	\$100.00
Travel Cost	\$100.00
Parts Cost	\$150.00
Spares Cost	\$ 20.00
P.M.	\$ 50.00
	<hr/>
	\$420.00

Monthly Cost	
	\$ 35.00
12	\$420.00
Per Month	\$ 35.00
Profit 10%	<hr/> \$ 3.50
	\$ 38.50 Monthly Maintenance Charge

- Burdened Hourly FE Rate - Total field service costs minus all FE development costs divided by the total F.E. headcount (include only field engineers).
 - MTTR - Average time to repair an equipment malfunction.
 - PM - Preventive maintenance requirements.
 - Parts Use - Average cost of part replaced.
 - Spares requirements - Percentage of spares to install base.
 - Travel - Average travel time required per call (cost based on burdened hourly FE rate).
- Exhibit VI-2 shows the maintenance cost of a product not performing up to its established objectives. A loss of \$25.67 a month is experienced. As the volume of shipments increases, Exhibit VI-3 demonstrates the effect this loss has on field service revenues. This example is exaggerated, but it demonstrates the need for field service involvement early in the product development cycle.
 - Exhibit VI-4 also demonstrates the effect this same problem has on the profit realized from the sale of the product. If a \$3,400 profit was made on the initial sale, over 45% would be lost in five years. This becomes worse as initial profits are lowered. The only alternative is to upgrade through engineering changes the products installed. This upgrading has a loss factor also.
 - Vendors also generally agree that a product maintenance price should not be greater than 15% annually of the product's original purchase price.

EXHIBIT VI-2

POORLY PERFORMING PRODUCT

MTBF - 4,330 Hours, 2 Calls per Year
 MTTR - 1.0 Hours
 Travel - 1.0 Hours
 FE Hourly Rate - \$100.00
 P.M. - .5 Hours
 Parts Usage - \$150.00
 Spares Req. - 5% (Parts Kit Cost \$2,000.00 - Depreciation 5 Years)

Yearly Call Cost Plus P.M.	
Repair Cost	\$200.00
Travel Cost	\$200.00
Parts Cost	\$300.00
Spares Cost	\$ 20.00
P.M.	\$ 50.00
	<hr/>
	\$770.00

Monthly Cost	
	\$ 64.17
12	<hr/>
	\$770.00
Monthly Cost	\$ 64.17
Revenue	<hr/>
	\$ 38.50
Monthly Loss	(\$25.67)

PROJECTED PROFIT AND LOSS FOR PRODUCT

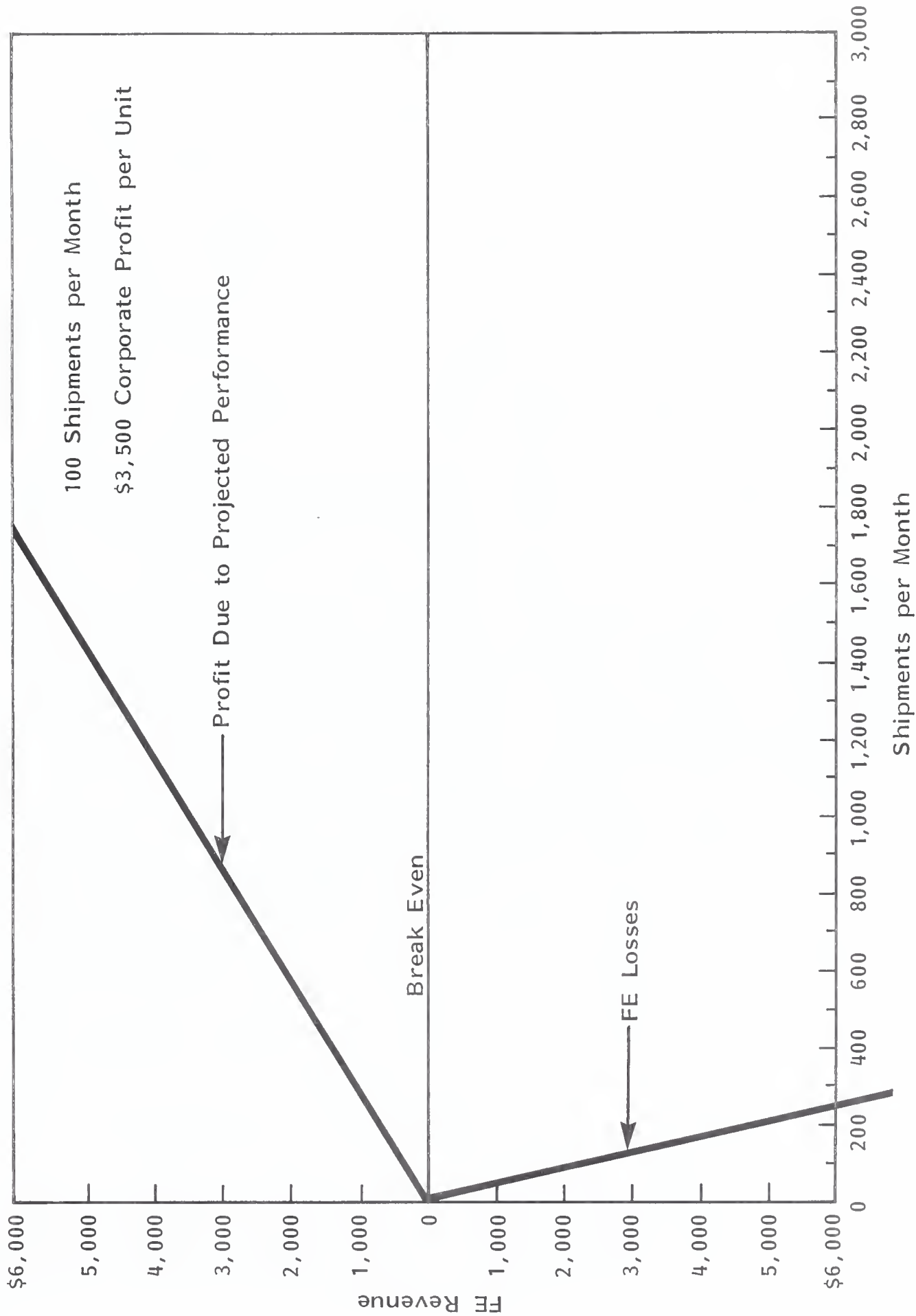
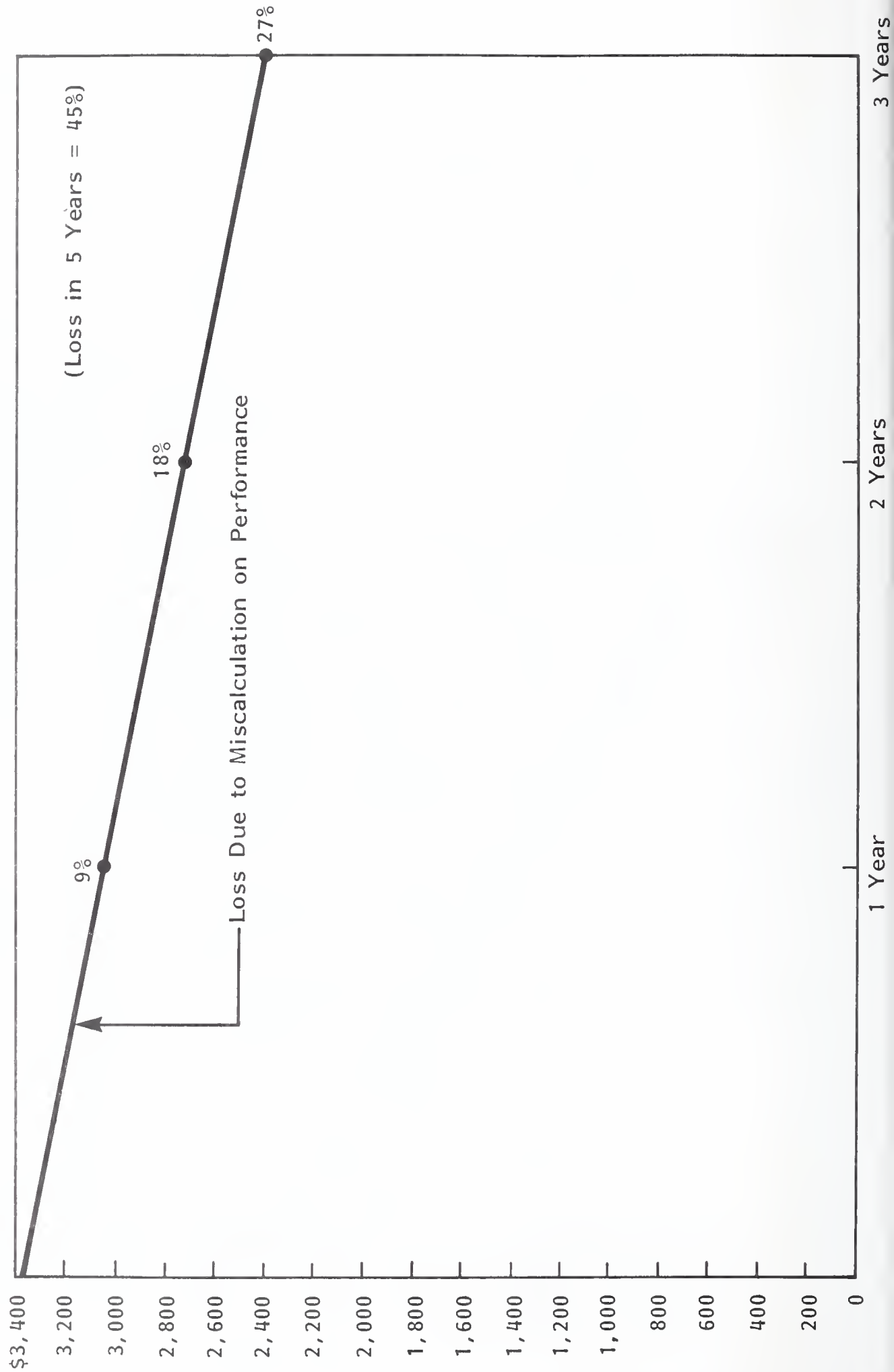


EXHIBIT VI-4

PRODUCT PROFIT LIFE CYCLE PER UNIT



B. FREQUENCY OF PRICE CHANGES AND RECENT TRENDS

- Maintenance price changes are generally done on an annual basis. However, product performance, product price changes, and competition can alter this. Changes are most frequent during initial introduction of products because predicted performance normally differs from real performance.
- Changing costs usually determine new service prices. However, these adjustments should be in keeping with industry modifications. Over the past several years maintenance prices have stabilized, with some actually decreasing.

C. DISCOUNTS RELATED TO DELIVERY METHODS

- The office products section of the systems maintenance business has been more affected by the recent practice of discounting than have most other areas. Vendors employ several methods when offering discounts. Most methods are based on volume or use involvement. Several offerings follow:
 - Volume discounts for equipment in one location.
 - Scheduled maintenance.
 - Mail-in repair.
 - Pick-up service.
 - Central user repair site.
 - Unit exchange.

- Exhibit VI-5 shows how most vendors calculate these discounts. Discounts are based on the savings realized by planning maintenance calls or by repairing equipment in a central location.
- As Exhibit VI-5 demonstrates, several methods of discounting may be used. The examples mostly show the savings realized by reduced travel costs. Other savings can be achieved by users' purchase of spares, user replacement of parts, etc. A new program introduced is the sale of maintenance coupons. This is a method of prebilling maintenance.

D. PREMIUMS RELATED TO PERFORMANCE GUARANTEES

- Several vendors are offering or plan to offer guaranteed performance plans. The most common plans are guaranteed availability, guaranteed response, and on-site spares. The premiums vendors plan to charge are not available; however, little negative affect on the vendor is expected. Premium determination will be handled in a manner similar to that for the users' request for a resident field engineer.
- In the office product environment the success of such performance guarantee offerings is questionable. The amount users are prepared to pay for this type of service may not cover the costs involved.
- An example is the users' attitude toward paying for guaranteed response. Thirty-three percent of users wanted the option but were willing to pay a premium of only four percent. The demand for this option is probably greatest in the personal computer sector. A difficult problem is how vendors can get their distributors to offer this when they are even now having serious problems responding within a reasonable time.

EXHIBIT VI-5

CALCULATING MAINTENANCE PRICE DISCOUNTS

First Calculate Normal Repair Call		
MTBF - 1 Call per Year		
MTTR - .5 Hours		\$ 50.00
Travel - 1.0 Hours		\$100.00
Parts Cost - \$125.00		\$125.00
Spares - \$12.00		\$ 12.00
FE Rate - \$100.00 per Hour -		<u> </u>
		\$287.00 per Year
Mail-in Repair (Manufacturing)		
MTTR - .5 Hours		\$ 50.00
No Travel - 0		0
Parts Cost - \$125.00		\$125.00
Spares - \$12.00		\$ 12.00
		<u> </u>
		\$187.00 per Year
Carry-in Repair (Repair Center)		
MTTR - .5 Hours		\$ 50.00
No Travel - 0		0
Parts Cost - \$125.00		\$125.00
Spares - \$12.00		\$ 12.00
Administration - .3 Hours		\$ 30.00
		<u> </u>
		\$217.00 per Year

Continued

EXHIBIT VI-5 (Cont.)

CALCULATING MAINTENANCE PRICE DISCOUNTS

Volume Discounts (One Location)	100 Units
MTTR - 0.5 Hours	\$ 50.00
Travel - 0.7 Hours	\$ 70.00
Parts Cost - \$125.00	\$125.00
Spare Cost - \$12.00	<u>\$ 12.00</u>
	\$257.00 per Year

Scheduled Maintenance and Volume Discounts, One Location or
Central User Site

MTTR - .5

Travel based on following table with MTBF at one call per year.

Units Services	Calls per Week	Repairs per Week	Travel Cost per Unit	MTTR	Parts Use (Avg.)	Spares Cost	Repair Hourly Cost	Yearly Total Cost per Unit
(1- 52)	1	1	\$100.00	.5	\$125.00	\$12.00	\$50.00	\$287.00
(52-104)	1	2	\$ 50.00	.5	\$125.00	\$12.00	\$50.00	\$237.00
(104-156)	1	3	\$ 33.00	.5	\$125.00	\$12.00	\$50.00	\$220.00
(156-208)	1	4	\$ 25.00	.5	\$125.00	\$12.00	\$50.00	\$212.00
(208-260)	1	5	\$ 20.00	.5	\$125.00	\$12.00	\$50.00	\$207.00
(260-312)	1	6	\$ 17.00	.5	\$125.00	\$12.00	\$50.00	\$204.00

Continued

EXHIBIT VI-5 (Cont.)

CALCULATING MAINTENANCE PRICE DISCOUNTS

Agreed-upon Minimum Number Repairs per Call		
MTBF Not Considered		
MTTR - 0.5 Hours		\$ 50.00
Repairs per Call - 6		-
Parts Cost - \$125.00		\$125.00
Spares Cost - \$12.00		\$ 12.00
FE Rate - \$100.00		-
Discounted Travel ÷ 6		\$ 17.00
		<u>\$204.00 per Year</u>

- Vendors are unlikely to offer guaranteed repair time or software turnaround time.

E. ZONE CHARGES AND HOURLY RATES

- Zone charges have been and continue to be common throughout the industry. In the area of high-volume products, such as office products, zone charges greatly affect the ability to sell products in remote areas. Options such as third-party maintenance and maintenance agents are beginning to be offered.
- Hourly rates to users average \$80 to \$90 per hour. Vendors hourly costs run \$62 to \$70 per hour. The use of third-party maintenance companies creates the need for generating this much margin on rates.

VII VENDOR CASE STUDIES

VII VENDOR CASE STUDIES

A. APPLE COMPUTER, INC.

- In 1982 Apple held an 18% share of the business personal computer market. Apple's share of the market in 1983 can be expected to remain fairly constant, but due to slower than expected sales of the Apple III and LISA and to new products from IBM, DEC, and others, Apple's share of the market can be expected to drop.
- In order to avoid providing costly service themselves, Apple adopted a two-pronged service philosophy:
 - Use an extensive network of authorized dealers.
 - Use third-party maintenance organizations.
- The bulk of Apple's support comes from a three-level maintenance structure, involving their dealer network, their regional offices, and their headquarters service group.
- The front line of the Apple maintenance process is their extensive network of Apple authorized dealers, which currently number 1,500 throughout the United States. To become an authorized servicing dealer, one must meet three requirements: first, one must maintain a minimum service inventory; second,

one must have Apple service kits for all products sold; and third, one must send one's staff to Apple for training.

- The second level of service is made up of seven regional offices covering the U.S. These offices provide support for the dealer network. Any problems that regional offices cannot overcome are sent to the home services group at Apple's headquarters.
- The basic program available to users through the Apple dealer network is called AppleCare carry-in service. This offering replaces the old AppleCare program that basically extended the warranty from 90 days to one year. The new program extends the warranty to a year, but also allows the contract to be renewed on an annual basis and offers users a fixed annual price that is up to 30% lower than before.
- Some large-volume users can qualify to maintain their own equipment. To qualify as "servicing owners," users must demonstrate that they are running critical applications (and are thus unable to afford extended downtime) and have no access to a local Apple dealer. "Servicing owner" users receive a spares kit and training (much the same as what dealers receive); all maintenance is performed as component exchanges.
- An alternative maintenance source available to Apple users is on-site repairs offered by RCA Service Company. RCA offers on-site service on either a contract or time-and-materials basis. They have 220 offices in the U.S.

B. CPT CORPORATION

- CPT designs, manufactures, sells, and services office automation equipment. The sales and support of these products is provided by an extensive independent dealer and distributor network in over 600 cities in the U.S. Total

revenues for the company grew 23% from fiscal year 1982 to fiscal year 1983. Revenues from service and rentals increased at an even faster rate, from \$16.4 million in 1982 to \$21.3 million in 1983, representing a 30% increase.

- Product support at CPT is divided into six departments: technical training, support products, applications support, systems support, product support, and supplies and accessories sales. Each of these six departments provides to dealers and distributors the specialized assistance that is necessary to assure that CPT customers receive complete maintenance service.
 - The Technical Training Department provides dealers and distributors with all documentation needed to support CPT equipment. Also, this department is responsible for periodic regional seminars and in-house training sessions.
 - The Support Products Department provides all spare parts, supplies, accessories, and related literature to dealers and distributors.
 - The Applications Support Department aids dealers and distributors in the installation and support of all remarketed applications programs.
 - The Systems Support Department provides all operational support for hardware, software, and communications devices included in CPT systems. This group is also responsible for tracking service problems and acts as the point of contact for dealers and distributors.
 - The Product Support Department works with the design and production operations within CPT in order to assure serviceability of all products. This group is responsible for all product testing.
 - The Supplies and Accessories Department is responsible for marketing all accessories and supplies to dealers and distributors.

- An important CPT philosophy that goes against industry trends is their practice of bundling all support programs.

C. IBM

- The total 1982 business personal computer market was just over \$3.5 billion dollars, with \$375 million spent on hardware and software support. By 1987 these figures should grow to a little over \$10 billion (a 23% annual growth) and \$1.25 billion (a 28% annual growth) respectively.
- In 1982, IBM's share of the business personal computer market was 23%. This proportion undoubtedly grew in 1983.
- In the past, IBM provided service for their PCs through the purchase source, either dealers, IBM product centers, or the National Marketing Center.
 - IBM, through its product centers or through the National Marketing Center, provided maintenance via carry-in, mail-in, or courier service (if within a 20 mile radius of a product center).
 - Dealers provided service at their own prices and were reimbursed at \$38/hour by IBM.
- In spring of 1983, IBM announced a more complete service offering, including the option of on-site maintenance through their IBM service/exchange centers. IBM offers four delivery options:
 - Mail-in to a regional repair center.
 - Carry-in to any IBM service/exchange center.

- Courier pickup and delivery arranged by IBM.
- On-site service, offered initially in 38 cities.
- IBM has adopted a philosophy of building an independent support structure around its personal computer. In keeping with this, IBM utilizes independent trainers working out of selected IBM product centers to provide training on their PCs. The classes offered at the product centers are open to all IBM PC users, and are currently priced at \$95 per four-hour class. These classes are currently offered in 75 cities.

D. NBI, INC.

- With annual revenues of \$121 million in fiscal year 1983, NBI qualifies as one of the largest manufacturers of dedicated word processor systems. Field service revenues were estimated at approximately \$15 million.
- NBI recently realigned its field service operations by placing field support and communications support, which previously had reported to marketing, under technical support. The advantage of this realignment is better control and coordination of all customer support activities.
- The field support operations include a network of support centers that provide operational assistance to FEs on software problems. In addition, the field support specialists keep a running log of software problems, and review these problems within the engineering, product test, and marketing organizations within the company. In this sense, the field support centers provide service assistance to the FEs and act as a communications link between headquarters and the products in the field.

- NBI's communication support organization provides problem-solving assistance for all 3270 communications equipment via toll-free lines.
- Hardware questions are addressed by NBI's technical support centers.
- NBI sees the growing use of remote diagnostics as a supplement to the increased service needs of their users, yet the company will continue to stress the need for improved interpersonal communications between vendors and users.

E. WANG LABORATORIES, INC.

- Wang, a leader in both data processing workstations and word processing equipment, epitomizes the move toward providing total company service for its users.
- In September 1983, Wang reorganized its field service operations by adding its customer supplies and training organizations to its field services operations in order to form a single marketing services unit. In the past, customer training was a part of sales, and supplies were a part of manufacturing. The advantage of this reorganization is the reduction of duplicated effort and the improvement in service coordination.
- In addition, Wang announced that it would combine hardware and software services at support centers, rather than have them separated as they had been previously. This regrouping will enable Wang to focus more attention on software service and provide more coordination between hardware and software support.
- These actions represent Wang's attempt to further improve their field services operations, which saw revenue gains from \$135.5 million in fiscal 1982 to \$222

million in fiscal 1983, an increase of 64%. Profitability has improved from a \$.43 loss per field service dollar in 1980 to a \$.18 profit in the current fiscal year.

- The basis for Wang's support is their WangCare total service support program, which includes guaranteed uptime at the 95% level on the core system elements of most Wang equipment. Wang also offers increased uptime guarantees of 98% and 99% for additional premiums. In addition to the improved availability guarantees, Wang also guarantees that response times will be reduced to two hours or less (if within 25 miles of a service office) or to three hours or less (if within 50 miles of a service office).
- Other service features include local supplies inventories, remote diagnostics, technical support centers, customer satisfaction surveys, periodic equipment performance reviews, and optional standby support.
- Wang sees the use of remote diagnostics that are built into the system as having a greater impact on user support in the near future, both in hardware and software.
- Another delivery method growing in user acceptance is user self-maintenance. Wang feels that the ability to install one's own system and provide limited support is increasing, leading to greater user self-sufficiency.

F. XEROX CORPORATION

- Xerox's principal industry segments include reprographic equipment, printing systems, memory devices, information processing products, and other office automation equipment. Total corporate revenues for 1983 were just under 8.5 billion dollars. Rental and services revenues accounted for \$5 billion of that total.

- Xerox offers a wide range of services for its personal computers, including customer carry-in and mail-in, pickup and delivery, pickup and delivery with free loaners, and on-site maintenance. These options can be selected for the entire system or for individual components. All services are available through Xerox's network of 75 Xerox Service Centers that are located in major metropolitan cities throughout the U.S.
- Another service alternative is time-and-material service, available by contract only. Time-and-material contract holders qualify for on-site service.
- Due to the wide range and large number of equipment produced by Xerox, the demand for documentation to support that the equipment requires that Xerox create and maintain a large volume of information. Additionally, Xerox's worldwide market requires that Xerox translate documentation into 17 different languages. In order to facilitate this translation, Xerox organized their Xerox Multinational Service Education group, whose responsibilities include gathering information on technical design and maintenance procedures in order to produce documentation material that is both accurate and complete.
- The size of Xerox's undertaking is illustrated by the following example. The documentation of a typical copier contains 250 pages of functional documentation, 50 pages of electrical information, 50 pages of installation procedures, and 22 microfiche cards containing 1,500 frames of maintenance procedures. In order to produce the manuals for the 100-plus products used in the 50 countries that Xerox serves, 147,000 original pages of documentation were produced in 1982.
- Xerox has completely automated their documentation process. This process utilizes a 6,000-word technical vocabulary, called Multinational Customized English, which automatically translates text into French, German, Italian, Spanish, and Portuguese. Another computer checks for parts list accuracy. These steps have resulted in productivity gains of 5 to 1 in translation, 4 to 1 in production, and 1.5 to 1 in design and development.

VIII RECOMMENDATIONS

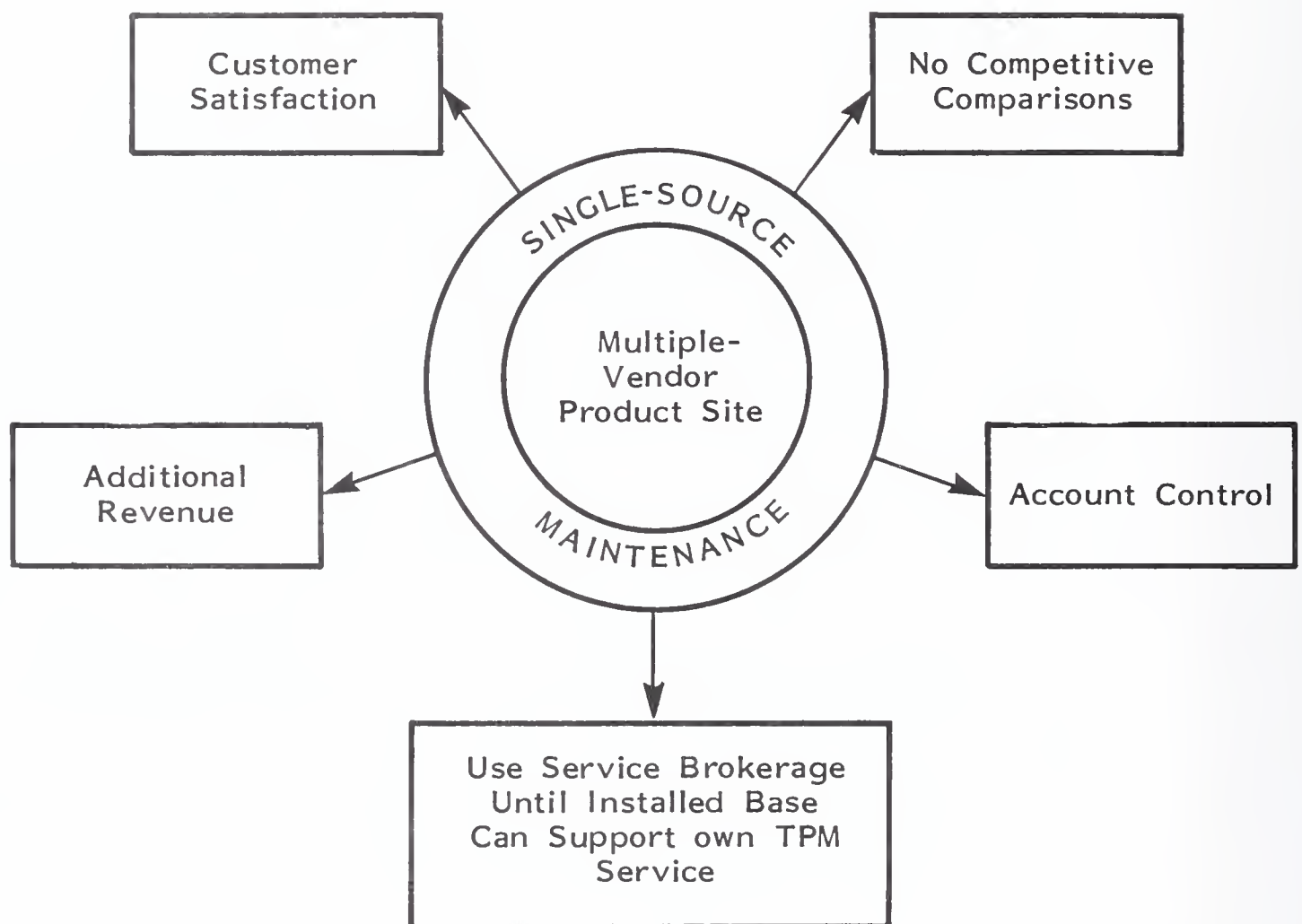
VIII RECOMMENDATIONS

A. CONCLUSIONS

- The office products market is growing so quickly in size and sophistication that office product vendors will need to address the increased service needs of their users. This need becomes even more important as users become more dependent on their equipment. These factors require that vendors reorganize their field service organization in order to accomplish the following objectives:
 - More cost-effective and responsive support.
 - A single source of service for all postsale hardware and software support, the advantages of which are shown in Exhibit VIII-1.
 - Development of service plans for future products and growth, including the increased use of local-area networks.
- In situations where vendors find it more cost-effective to provide service to their users through independent sources (such as third-party maintenance organizations, dealers, and distributors), vendors should also realize that users will still judge the equipment vendor by the service that they, the users, receive. Vendors will need to improve their communications with end users through telephone support services in order to maintain control over the customer and assure future business.

EXHIBIT VIII-1

ADVANTAGES OF SINGLE-SOURCE MAINTENANCE



B. IMPROVEMENTS IN EXISTING SERVICES

- In the INPUT report Analysis of User Requirements for Office Products, October 1983, an obvious conclusion was that there was a need for more consistent service from vendors. No other product category received a poorer rating of all service areas by users. With the growing use and reliance on office products, vendors will need to bring about improvements in the following areas:
 - Documentation (41% dissatisfied).
 - Hardware maintenance (32% dissatisfied).
 - Software maintenance (30% dissatisfied).
 - Training (20% dissatisfied).
- Of paramount importance is the need for improved documentation and training, especially because the overall sophistication level of office products users is lower than that for other product types. Field service should become more involved in the documentation process, as a large number of service calls are the result of user ignorance.
- Vendors need to address the disparity between user requirements and vendor offerings, and to view the recommended improvements as opportunities for growth in service quality, customer satisfaction, and (most importantly) revenue growth.

C. EXTENDED SERVICE OFFERINGS

- Vendors have seen that the field service organization can and should be operated as a profit center. Thus a goal of field service administration should be the exploration of new revenue sources available through field service. Two areas seen by INPUT as ripe sources of service revenues include the following:
 - Multiple service offerings available to office product users with appropriate service pricing premiums or discounts.
 - Increased sales involvement by field service personnel.
- INPUT found that while most users desire to have on-site maintenance, office products users were the most willing of all product users to accept alternative delivery methods, especially if a sufficient discount is available. Vendors can offer service plans at an appropriate discount and can allow users to work with telephone support centers that will reduce service costs by reducing diagnostic time.
- Offering alternative service offerings will also allow users to choose which amount of service best fits their needs. Some users will determine that extended coverage will be needed. An increased service option that INPUT recommends is localized spare parts inventories, already being successfully offered by some vendors. INPUT found that with a 5% premium for this offering, vendors can realize a optimum revenue increase of 1.3%.
- Vendors should also consider increased field service involvement in the sales process as a source of revenues. INPUT found that users are receptive to an increased role in certain sales activities by field engineers. This will also bring about better coordination between sales and service, improving the total support given to users. INPUT is not recommending that field service should

take over the sales function, but rather that it should take an increased role in providing sales support for existing customers. Field service should be involved in the continued support of the client base, allowing the sales staff to concentrate on new account development. This increased field service involvement would benefit the company by providing better user feedback and would eliminate duplicated visits by service and sales personnel.

D. IMPROVED FIELD SERVICE ADMINISTRATION

- In order to improve the profit ratio of the field service organization, internal improvements in field service administration will have to be addressed. These operational recommendations will have a two-fold effect: first, the recommendations will lower operations costs; and second, they will improve user satisfaction by improving service.
- Field service organizations should move to a centralized automated system that would handle dispatching, escalation, and invoicing activities. This would bring about improvements in response times, total repair times, and billing procedures, while improving the coordination of these administrative duties. A centralized automated system would also facilitate the historical analysis of fault calls.
- Vendors should also automate their spare parts distribution and storage processes, if used with real-time incident reporting that includes parts use. This would be a vast improvement over weekly or monthly parts use reports.
- Field service management needs to address the increasing use of local-area networks in conjunction with office products. Rather than relying on fault determination, which is seen by users as "finger pointing," vendors need to address the users' desire for single-source service on all equipment within the network. Vendors can address this problem from two directions:

- Providing maintenance on competitive products themselves, acting in a sense as a third-party maintenance organization. This will require extensive retraining of field service personnel and the acquisition of sufficient spares, parts, and test equipment.
- Providing a maintenance management contract, which will allow the vendor to subcontract the service of competitive products to third-party maintenance organizations. This gives vendors control over the users' service contracts, and provides users with single-source maintenance without requiring vendors to retrain personnel or restock spares and equipment.
- Finally, vendors can improve support service before the product ever gets to the end user by having increased field service involvement in product and documentation design, development, and production. Considering the reported lack of field service management influence in these important processes, one might conclude that vendors are more concerned about shipping out the product, without any regard for lost revenues caused by product support. Field service, with continual contact with end users, can see first-hand problems caused by poor product design or by unclear documentation. Increased field service involvement in these areas will result in improved MTBF, fewer calls per year, lower travel expenses, fewer "no fault found" calls, increased user satisfaction, and, consequently, more revenue.

APPENDIX: QUESTIONNAIRE

A. General Management

1. Which of the following services do you currently offer or plan to offer by 1985?

DIRECT SERVICE OFFERED	1983	BY 1985
a) Third-party maintenance	<input type="text"/>	<input type="text"/>
b) Facility maintenance management	<input type="text"/>	<input type="text"/>
c) Guaranteed availability (uptime)	<input type="text"/>	<input type="text"/>
d) Guaranteed response time	<input type="text"/>	<input type="text"/>
e) Guaranteed repair time (hardware)	<input type="text"/>	<input type="text"/>
f) On-site standby	<input type="text"/>	<input type="text"/>
g) Variable shift coverage (versus fixed schedules)	<input type="text"/>	<input type="text"/>
h) On-site spares	<input type="text"/>	<input type="text"/>
i) Guaranteed turnaround on software repairs	<input type="text"/>	<input type="text"/>
j) Remote diagnostics	<input type="text"/>	<input type="text"/>
k) Preventive maintenance and field changes during nonprime hours	<input type="text"/>	<input type="text"/>
l) System software maintenance	<input type="text"/>	<input type="text"/>
m) Application software maintenance	<input type="text"/>	<input type="text"/>
n) Depot maintenance (pickup)	<input type="text"/>	<input type="text"/>
o) Depot maintenance (carry/mail)	<input type="text"/>	<input type="text"/>
p) Local area network maintenance	<input type="text"/>	<input type="text"/>

2. Which of these secondary services do you offer or plan to offer by 1985?

ANCILLARY SERVICES OFFERED	1983	BY 1985
a) Environmental planning	_____	_____
b) Physical site planning (layouts)	_____	_____
c) Consulting services (hardware)	_____	_____
d) Consulting services (software)	_____	_____
e) Customer training	_____	_____
f) Installation management and coordination	_____	_____
g) Supplies sales	_____	_____
h) Add-on sales (additional equipment)	_____	_____
i) Upgrade sales (new equipment or features)	_____	_____
j) Site audits	_____	_____
k) Facility relocation	_____	_____
l) De-installation	_____	_____
m) Software sales	_____	_____

B. Field Support/Product Support

1. Please rate the influence of your field service management in the following activities. (Scale of 1-10: 10 = excellent, 5 = average, 1 = very poor.)

ACTIVITIES	RATING (1-10)	
	1983	1985
a) Product specification	_____	_____
b) Product design	_____	_____
c) Serviceability design	_____	_____
d) Documentation	_____	_____
e) Diagnostic development	_____	_____
f) Selection of test equipment	_____	_____
g) Spares requirements	_____	_____
h) Geographic control of sales	_____	_____
i) Exceptions to standard maintenance agreements	_____	_____
j) Product performance objectives	_____	_____
k) Quality control in manufacturing	_____	_____
l) OEM acceptance criteria	_____	_____
m) Customer education	_____	_____

2. To what extent has software support been integrated into hardware support structure? By 1985?

SOFTWARE SUPPORT ACTIVITY	1983	1985
a) System Control Software	_____ %	_____ %
b) Application Software	_____	_____
c) Maintenance of Third-party software	_____	_____

3. On a scale of 1-10 (10 = high) how important is it to you to offer the following types of services:

1-10

- a) Field support via remote diagnostics

- b) Field support via user self-diagnostics

- c) Telephone field support

- d) On-site field support

4. What are your objectives and what did you achieve in these following measures of product performance; (break down by type of product e.g., mainframe, mini etc.)

PRODUCT TYPE	MEAN TIME TO REPAIR (hours)		MEAN TIME BETWEEN FAILURES (hours)		AVERAGE AVAILABILITY (percent)		MEAN TIME TO RESPOND (hours)	
	OBJ.	ACT.	OBJ.	ACT.	OBJ.	ACT.	OBJ.	ACT.
a) _____								

b) _____								

c) _____								

d) _____								

e) _____								

5. Do you currently offer or do you plan to offer any of the following services?

	CURRENTLY IMPLEMENTED? YES/NO	IMPLEMENTED BY 1985? YES/NO
a) Remote diagnostics	_____	_____
b) Centralized dispatching	_____	_____
c) Modular, plug-in units for user to deliver to repair centers	_____	_____
d) Real-time incident reporting	_____	_____
e) Real-time IR (parts usage included)	_____	_____
f) Regional repair centers	_____	_____
g) Third-party repair centers	_____	_____
h) Third-party on-site maintenance	_____	_____

6. a) What do you see as the trend in capital investment in spare parts inventories?

YEAR OF MEASUREMENT	PERCENT OF GROSS SERVICE REVENUES FOR YEAR
1983 (most recent inventory)	_____ %
1985 (projected)	_____ %

b) Why, or could you comment on this trend?

Comment: _____

7. a) Have you announced or have you set a policy on the maintenance and support of local area networks serving competitive products? Yes/No _____

b) Comment:

C. Personnel

1. Please identify your sources of new employees and rate them on a scale of 1-10. (1 = little or no importance, 10 = highest importance.)

SOURCE OF NEW EMPLOYEES	RATING (1-10)	
	1983	1985
a) Competition	_____	_____
b) Trade schools	_____	_____
c) Military schools	_____	_____
d) Two-year college programs	_____	_____
e) Four-year colleges	_____	_____
f) Apprenticeship programs	_____	_____
g) Other division in company	_____	_____
h) Employee referrals	_____	_____
i) Other:	_____	_____

2. Do you provide in-company formal training? If so, in what areas?

	YES/NO
a) Indoctrination	_____
b) Basic training (apprentice level)	_____
c) Product (technical)	_____
d) Systems software (system)	_____
e) Applications software	_____
f) Management development	_____
g) Technological upgrading	_____
h) Other	_____

3. Do you (F) fully or (P) partially reimburse or otherwise provide financial support for:

	F/P
a) Education/training	_____
b) Relocation	_____
c) Company products/stocks	_____
d) Professional associations/memberships/journals	_____
e) Other _____	_____

4. Which personnel policies do you think have a significant impact on the satisfaction level of your employees?

FRINGE BENEFITS	1983	BY 1985
a) Life insurance	_____	_____
b) Hospitalization	_____	_____
c) Major medical (80% or better)	_____	_____
d) Limited medical (out patient)	_____	_____
e) Dental	_____	_____
f) Eyesight/glasses	_____	_____
g) Retirement	_____	_____
h) Disability insurance	_____	_____
i) Matched savings	_____	_____
j) Profit-sharing	_____	_____
k) Paid sick leave	_____	_____
l) Grievance procedures	_____	_____
m) Improvement programs for marginal performers	_____	_____
n) Exit interviews	_____	_____
o) Appraisal and counseling	_____	_____
p) Career path definitions	_____	_____
q) Pay for performance guidelines	_____	_____

5. What incentives are offered to field service employees?

INCENTIVES	MANAGEMENT		EXEMPT		NONEXEMPT	
	1983	BY 1985	1983	BY 1985	1983	BY 1985
a) Stock options	_____	_____	_____	_____	_____	_____
b) Performance bonuses	_____	_____	_____	_____	_____	_____
c) Suggestion awards	_____	_____	_____	_____	_____	_____
d) Periodic recognition awards ("FE of the quarter," etc.)	_____	_____	_____	_____	_____	_____
e) Special projects, foreign assignments, etc.	_____	_____	_____	_____	_____	_____
f) Award conferences, trips	_____	_____	_____	_____	_____	_____
g) Competitive scholarships for employees or family	_____	_____	_____	_____	_____	_____
h) Other: _____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

6. a) How many direct labor field service personnel were hired in:

1983 _____ (forecast)

1985 _____ (forecast)

b) How many direct-labor field service personnel will leave your company in:

1983 _____ (forecast)

1985 _____ (forecast)

c) What are the major reasons for persons leaving your department or company?

	1983
i) Voluntary, no reason given	_____
ii) Left for higher salary, better total compensation	_____
iii) Released for company reasons	_____
iv) Promotion in another company	_____
v) Relocation by another company	_____
vi) Promoted within own company	_____
vii) Transferred to foreign subsidiary or other division	_____
viii) Other _____	_____
Total	_____

d) What are your present and future staffing levels in the following areas?

U.S. EMPLOYEES	1983	1984
i) Total employees in company	_____	_____
ii) Total in field service division	_____	_____
iii) Number of direct-labor FEs	_____	_____
iv) Number of field support engineers	_____	_____
v) Number of field supervisors	_____	_____
vi) Number of managers in field	_____	_____
vii) Line managers at headquarters	_____	_____
viii) FE staff managers (total)	_____	_____
ix) FE staff personnel (nonmanagement including administration)	_____	_____

7. 1983 annual salaries, office system field engineers (front-line product field service technicians)

JOB DESCRIPTION	TITLE	RANGE		AVERAGE PAID (actual)	AVERAGE GAIN OVER 1982 (percent)
		MAXIMUM	MINIMUM		
a) Entry-level trainee maintenance	Trainee				%
b) Qualified field service technician carries territory, requires occasional assistance, renders some aid to lower levels	Qualified Field Engineer				%
c) Senior-level field service technician: Generally gives more assistance than received, assigned field training duties to assist in development of first two categories	Senior Field Engineer				%
d) Qualified field service engineer in software support	Software Support Engineer				%
e)	Supervisor				%
f)	Line Manager				%

D. Financial/Administrative Operations

1. How do you measure changes in field service productivity?

MEASUREMENT METHOD:	YES/NO
a) Ratio of gross revenue carried per field service person	_____
b) Ratio of personnel to equipment by category	_____
c) Ratio of personnel to management	_____
d) Net ratio of expenses to revenue after cost of improvement	_____
e) Other _____	_____
_____	_____
_____	_____

2. Have you experienced productivity improvement in servicing in the following areas?

IMPROVEMENT	YES/NO	PRODUCTIVITY IMPROVEMENT (percent)
a) Remote diagnostics	_____	_____
b) Repair centers	_____	_____
c) Regional parts depots	_____	_____
d) Centralized dispatch	_____	_____
e) Support centers	_____	_____
f) Field education	_____	_____
g) Cross training	_____	_____
h) Multiple territory assignments	_____	_____
i) Other _____	_____	_____
_____	_____	_____
_____	_____	_____

3. Please indicate the percentage of total operating revenues credited to the field service division coming from the following categories. (If fiscal is different from calendar, please supply FY dates.)

SOURCE OF REVENUE CREDITS	PERCENT OF TOTAL REVENUE	
	1983	1985
a) Warranty	_____	_____
b) Third-party contracts	_____	_____
c) Installation charges	_____	_____
d) De-installation charges	_____	_____
e) Consulting	_____	_____
f) Parts sales	_____	_____
g) Supplies sales	_____	_____
h) Sales of ancillary equipment	_____	_____
i) Sales of software products	_____	_____
j) Maintenance of software products	_____	_____
k) Sales discounts on maintenance	_____	_____
l) Other _____	_____	_____
m) Other _____	_____	_____

4. Please indicate the percentage of total field service division expenses in the following categories (and supply FY dates if different from calendar year).

EXPENSE LINE ITEM	PERCENT OF TOTAL EXPENSES [use () to indicate credit]	
	1983	1985
a) Direct labor	_____	_____
b) Management and administrative	_____	_____
c) Benefits	_____	_____
d) Parts	_____	_____
e) Depreciation	_____	_____
f) Travel	_____	_____
g) Education	_____	_____
h) Logistics, repair depot, and other expenses not reported above	_____	_____
i) Overhead	_____	_____
j) Other significant categories	_____	_____

5. What was your overall financial performance in the following field service categories?

FINANCIAL PERFORMANCE	FISCAL YEAR END _____	
	1983	1985
a) Field service revenue (\$ millions)	_____	_____
b) Field service expenses (\$ millions)	_____	_____
c) Pretax profit (percent)	_____	_____
d) Revenue per field service engineer (direct labor)	_____	_____
e) Direct expense per field service engineer (direct labor)	_____	_____
f) Fully burdened expense per field service engineer (direct labor)	_____	_____

6. a) Please describe the methodology your company uses to set maintenance prices (percent of purchase tested against cost of service projection, etc.):

b) At what ratio of basic maintenance price to list price do you believe that:

i) Users will actively consider alternative sources	<div></div> %
ii) Users will definitely contract third party or maintain own equipment	<div></div> %
iii) Users will refuse to buy the original product, given the option	<div></div> %

c) How frequently do you expect to change prices of maintenance:

Comments:

d) Do you offer discounts for:

	PERCENT DISCOUNT
i) User assistance in remote diagnostics	<div></div> %
ii) User replacement of plug-in modules or units	<div></div> %
iii) User delivery of plug-in modules or units to repair center	<div></div> %
iv) Relaxed requirement on response time	<div></div> %
v) User purchase of spare parts kits	<div></div> %
vi) Other: <div></div>	<div></div> %

7. a) Are your maintenance contracts: (i) automatically renewed _____ or (ii) negotiated each renewal cycle? _____
- b) What is the length of your normal contract? _____ (months)
- c) Do you normally invoice (i) monthly _____, (ii) quarterly _____, (iii) semiannually _____, (iv) annually _____, (v) other _____.
8. a) Has your field service division implemented a field quality assurance program or other formal operational audit? Yes/No
- b) Comment: _____

9. What is the average cost breakdown of a typical fault call? (Please respond for products your company services.)

PRODUCT SERVICED	TOTAL COST (dollars)	DIRECT LABOR (percent)	TRAVEL (percent)	PARTS (percent)	OVERHEAD & SUPPORT
Large mainframes	_____	_____	_____	_____	_____
Medium mainframes	_____	_____	_____	_____	_____
Small systems	_____	_____	_____	_____	_____
Peripherals	_____	_____	_____	_____	_____
Terminals	_____	_____	_____	_____	_____
Word processors	_____	_____	_____	_____	_____
Personal computers	_____	_____	_____	_____	_____
Copiers, facsimile	_____	_____	_____	_____	_____
Work stations	_____	_____	_____	_____	_____
PABX, PBX	_____	_____	_____	_____	_____
Teleprocessing/communications	_____	_____	_____	_____	_____

